

# The Design of MobiGP by Using Tamagotchi

Siti Hafizah Ab Hamid, Nurulhuda Ismail  
Faculty of Computer Science and Technology  
University of Malaya  
50603 Kuala Lumpur  
MALAYSIA

sitihafizah@um.edu.my, kiddo\_cup@yahoo.com

## Abstract

*This paper presents a design of an educational mobile game for learning object-orientated programming concepts. The project is called MobiGP. The design is based on methods which are the story line method and Tamagotchi game. This based on the fact that mobile devices are getting more diffused, the pervasiveness of mobile learning (m-learning) and also the massive success of Tamagotchi worldwide. Instead of just playing a game, we try to expand the purpose of playing Tamagotchi. It supports a new paradigm of playing games from entertainment to an educational activity as an attempt to provide a new mean for the students to improve their knowledge of Object Oriented Programming (OOP) concepts instead of formal lectures and books. This paper explains more on the design part and methodologies chosen in developing MobiGP. Storyboard of the scenario for this game is also included in order to give a better view of how MobiGP will work. Our hypothesis is that, as students play this game, they will be able to understand the OOP concepts more and able to implement the knowledge in writing their own structured-programming codes during their course using any OOP languages. It is hoped that this game may be a useful method to improve the basic understanding of OOP concepts among the first year students of institute of higher learning (IHL).*

Keywords: Tamagotchi, m-learning, OOP, design

## 1. Introduction

In the past, learning process is taken place in schools and learning centers. But today, learning and teaching can be done via playing digital games whereby playing games promotes a higher-order thinking skill and decision-making skill [1][2][3]. Digital game as a platform to facilitate educational activities is not a new issue and it has been practiced so far in around the world. There are several existing digital games that have been designed to teach players object-orientation

programming language such as Core War, Dnafight, Robot Battle, Robocode and RobotWar. All of the games mentioned are online computer games, open source and can be downloaded from the Internet for free. However, these games required a programming skill from a user in order to play. This might be a restriction for those who do not have programming skill.

A research has indicated that mobile technologies can be an effective tool to cater students in a digital age [4]. There are signs of the motivating potential and possible learning effort of games played on mobile devices among youngsters [5]. Furthermore, the wide market and high demand of mobile games can be major influences towards the growth of m-learning [6].

A survey done by researchers from Universiti Kebangsaan Malaysia, Malaysia (UKM) has shown that programming skill among IHL students is low for both genders [7]. According to Dr. Hong Guo, the common problems in learning the OOP are insufficient prior knowledge in the fundamental concepts and general programming principles [8].

Therefore, we have come out with the idea to develop a game with a purpose to help students to understand the fundamental concepts of OOP via mobile.

## 2. Objective

The main objective of this paper is to provide a sneak preview on every detail of the early design of MobiGP for Programming Game for a better understanding of this game.

## 3. Tamagotchi

The following description is copied from the Wikipedia<sup>1</sup> but has been altered. In Japanese, "Tamagotchi" means small egg. Tamagotchi is a portable handheld digital pet which is created by Aki

<sup>1</sup> <http://en.wikipedia.org/wiki/Tamagotchi>



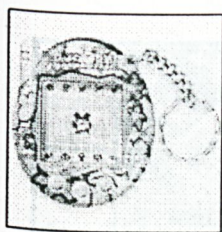


Figure 1.0 :  
Tamagotchi

Matia in 1996 and sold by Bandai<sup>2</sup>. It has been designed as a small, plastic egg-shaped case housing with an internal computer and three buttons named as A, B and C (see Figure 1.0). These buttons can be used to feed the Tamagotchi, play with it, clean the living quarters, check the

Tamagotchi's status (age, discipline, hunger, weight, happiness). The game starts when a user turns on the Tamagotchi and an egg appears on the screen and the user waits for five minutes until it "hatches". The Tamagotchi uses an eight function to call for its owner. Every action taken by the owner influences the growth and development of the Tamagotchi. The Tamagotchi's development progress involves four stages known as "baby", "child", "teenager" and "adult" stage. A few weeks after the Tamagotchi becomes an "adult", it dies or returns to its planet.

#### 4. Why Choose Tamagotchi?

Tamagotchi has its huge impact in game industry since 1996. Experts have been wondering what makes this game such a success. It would be better if we can adapt the huge influence of the Tamagotchi into something more meaningful such as education. That is why we have proposed this MobiGP for Programming Game. The impact of Tamagotchi is already there and we just add another extra impact on it by merging the "Tamagotchi-effect" into OOP learning process. "Motivational arousal may be a function of the extent to which the learner assumes personal responsibility for the outcome of behaviour. That is directly connected with something we call the 'Tamagotchi-Effect'". [9]

#### 5. Design

Basically, the main subject of this mobile game is Growing Up a Kitten. The theme is Basic Life Survival Necessities. The activities involved the role playing as a kitten owner.

##### 5.1 Methodology

###### 5.1.1 Programming game

The MobiGP for Programming Game is specifically designed for programming game.

###### 5.1.2 Domain

Object-orientation programming (OOP) is the type of domain that we chose for this game. The reason why OOP is chosen is that OOP is taught as the core subject for most top universities in the world. There are several ways of conducting OOP subject in universities across the world. However, the intention is only one to ensure the students understand the basic concept of class, object, encapsulation, data hiding, and inheritance [10][11][12][13].

##### 5.1.3 Tamagotchi style

The popularity of Tamagotchi leads to decision of using its method for this project. Its function is easy to understand to play. Besides that, it requires a simple program to run and offers little interface. Therefore, it is most suitable to be adapted onto this mobile game project.

##### 5.1.4 Story-line

This MobiGP is designed based on a story-line where a player must take care of a kitten in order to become a cat. The location is taken place in a jungle whereby the kitten is traveling on its own. Therefore, a player must feed the kitten, play with it and make sure that the kitten is in a good health in order to become a healthy cat at the end of the journey. This game takes about 48 hours to be completed.

##### 5.1.5 Adventure

The adventure element is included into this game where the kitten has to fight with some enemies along its journey.

##### 5.1.6 Mobile

MobiGP is definitely going to be developed using mobile platform in order to fulfill the requirement that have been set up.

##### 5.1.7 Offline

For the first prototype of this MobiGP, it would be an offline game and it supports single user only.

#### 5.2 Conceptual Design

This sub-topic explains more on the conceptual design including some of the storyboard designs and game flow-chart. The main interface of MobiGP is shown in Figure 2.0.

<sup>2</sup> Manufacturer and Japanese toys distributor (e.g Power Rangers and Tamagotchi Connection).



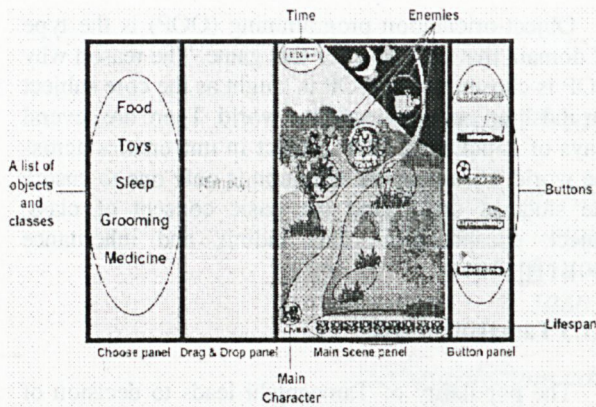


Figure 2.0 : First Interface of MobiGP

*Choose panel* – displays a list of objects and classes to be chosen by the players.

*Drag & Drop panel* – displays the objects and classes dragged by the players from the *Choose panel*.

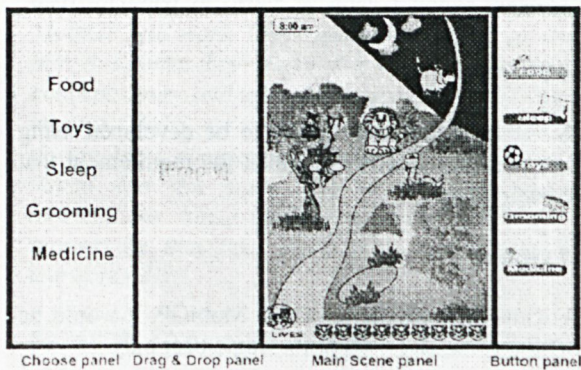
*Main Scene panel* – displays the whole game scene and shows the location of the main character.

*Button panel* – displays all of the buttons that can be clicked by the players.

There are only 5 buttons which are the Food, Sleep, Toys, Grooming and Medication buttons. These buttons represent the real world requirements for a cat in order for it to survive. It is a basic knowledge about the survival of the living things.

### 5.2.1 Storyboard for Feeding Activity

#### Frame 1 : Start – 8.00 am



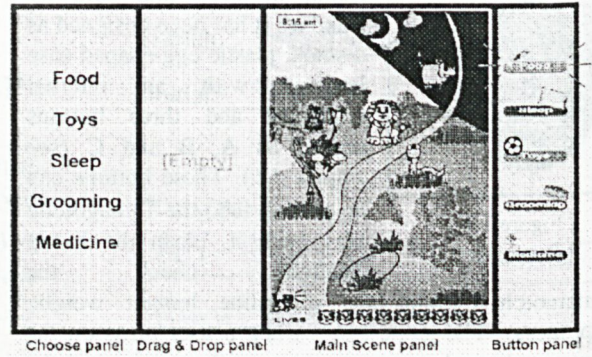
#### SCENE:

1. This is the first frame. It shows the whole scenario for this game.
2. The location is in a jungle.
3. The main character is a kitten – in red circle. The kitten just woke up from his sleep.

#### EFFECT:

1. Audio – jungle sound.


#### Frame 2a : 8.15 am – Feeding time



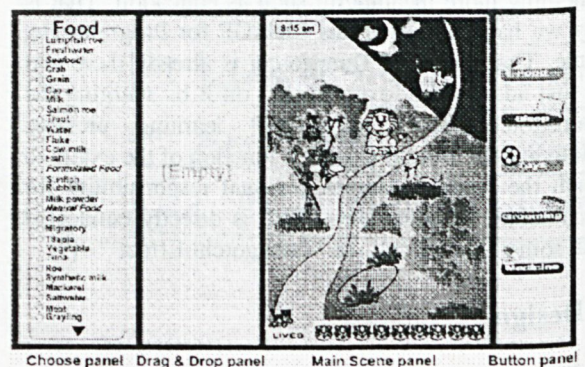
#### SCENE:

1. After 15 minutes, the kitten gets hungry and meowing. This indicates that the kitten has to be fed.
2. The food button in the Button panel is blinking and has to be clicked.
3. Once the Food button is clicked, options of food will be shown in the Choose panel.


#### EFFECT:

1. Audio – cat sound (meow).
2. Animation of the objects – the  button is blinking.

#### Frame 2b : Correct answer - Feeding time



#### SCENE:

1. Once the  button is clicked, a list of option is shown in the Choose panel.
2. The list consists of all types of cat food.
3. The Italic words such as Seafood, Formulated Food and Natural Food are the Abstract classes (see Figure 3.0).

#### EFFECT:

1. Audio – jungle sound.



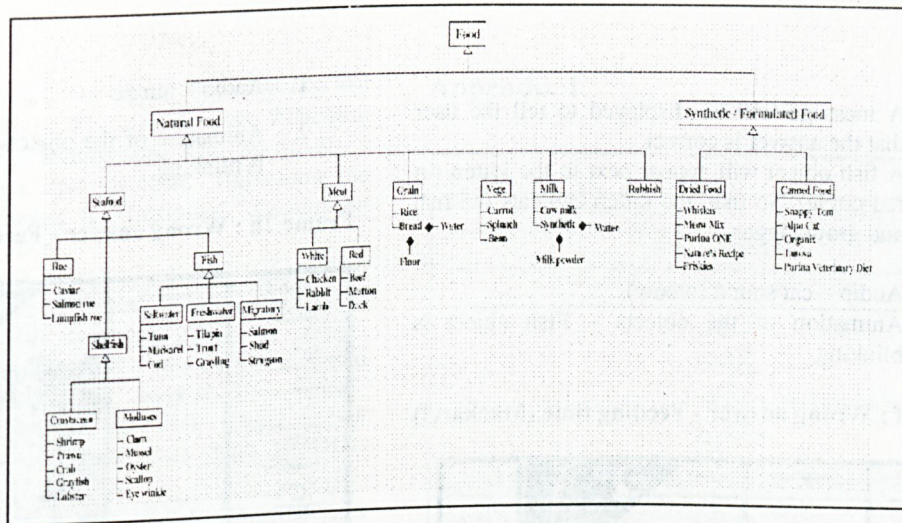
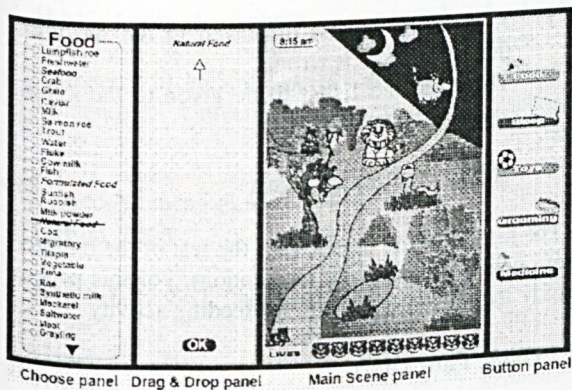



Figure 3.0 : A hierarchy of Food class

**Frame 2c : Correct answer - Feeding time (Mackarel)**



SCENE:

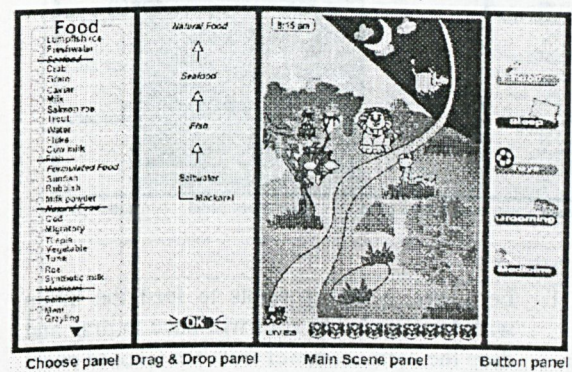
1. Let's say, a player wants to feed the kitten with Mackarel. The user will have to drag and drop the correct answer from the Choose panel into the Drag & Drop panel to inherit Mackarel from the correct class in a correct order / flow.

2. The  button is used to scroll down the list.

EFFECT:

1. Audio – jungle sound.

Frame 2d : Correct answer - Feeding time (Mackarel)



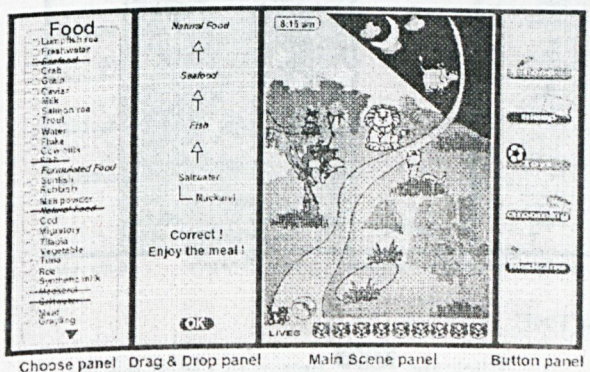
SCENE:

1. Click the **OK** button to check whether the answer is correct or not.

EFFECT:

2. Audio – jungle sound.
3. Animation of the objects – the **OK** button is blinking.

**Frame 2c : Correct answer - Feeding time (Mackarel)**





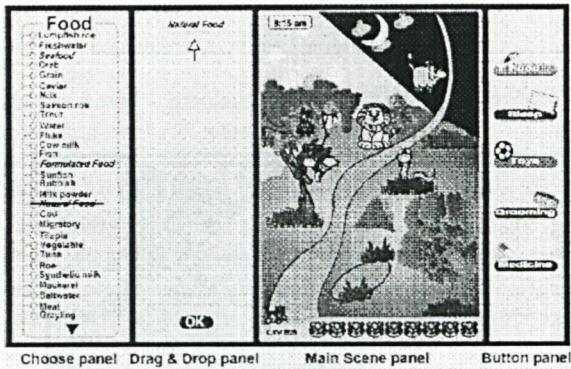
SCENE:

- 1. A message will be displayed to tell the user that the answer is correct.
- 2. A fish object will appear next to the kitten (in red circle). So that, the kitten can eat the fish and grow bigger.

EFFECT:

- 1. Audio – cat sound (meow).
- 2. Animation of the objects – Fish object is blinking.

Frame 2f : Wrong answer - Feeding time (Mackarel)



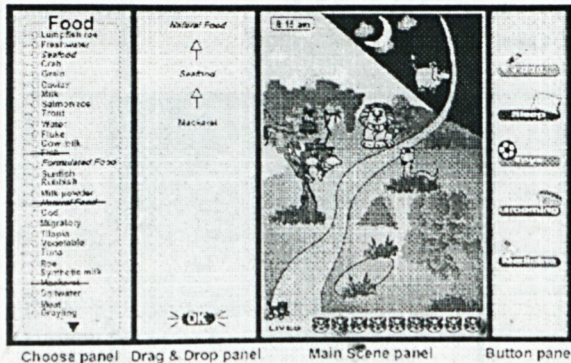
SCENE:

- 1. Let's say, a player wants to feed the kitten with Mackarel. The user will have to drag and drop the correct answer from the Choose panel into the Drag & Drop panel to inherit Mackarel from the correct class in a correct order / flow.
- 2. The ▼ button is used to scroll down the list.

EFFECT:

- 1. Audio – jungle sound.
- 2. Animation of the objects – blinking.

Frame 2g : Wrong answer - Feeding time (Mackarel)



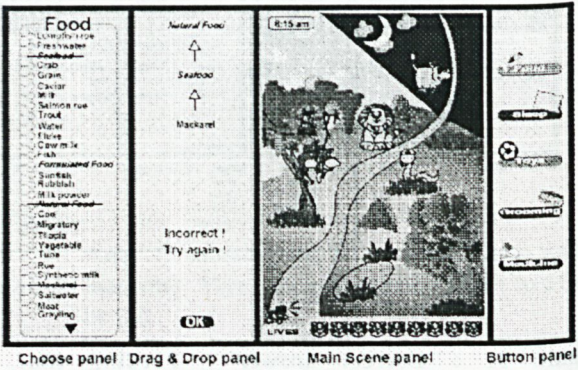
SCENE:

- 1. Click the OK button to check whether the answer is correct or not.

EFFECT:

- 1. Audio – jungle.
- 2. Animation of the objects – the OK button is blinking.

Frame 2h : Wrong answer - Feeding time (Mackarel)



SCENE:

- 1. A message will be displayed to tell the user that the answer is wrong.
- 2. Therefore, no fish will be given to the kitten and it will start meowing.

EFFECT:

- 1. Audio – cat sound (meow).

The same scenario applies for the rest of the buttons (sleep, toys, grooming and medication). For this paper, we only included the scenario for feeding activity.

5.2.2 Game Flow-chart

Please refer to Appendix 1 for the flow chart.

6. Conclusion

Basically, this game requires the users will to take a good care of the Tamagotchi (the kitten) in order to become a cat by feeding it, providing a good sleeping and playing time to make it happy, taking care of its cleanliness as well as its health. The kitten will have to fight with some enemies along the way. It is too early in the development of MobiGP to draw any conclusions. This paper only covers about the initial design of MobiGP including the storyboard, a hierarchy of classes and objects as well as the project flow chart. We hope to proceed with creating the prototype of this MobiGP afterward.

7. Acknowledgment

This work was supported by Malaysian Ministry of Science, Technology and Innovation under the Grant of Science Fund; 01-01-03-SF0122.

Reference



## Appendix 1

- [1] V.R. Eck, *Digital Game-Based Learning: It's Not Just the Digital Natives Who Are Restless*, *Educational Review*, Vol. 41, No. 2, March/April 2006, pp. 16-30.
- [2] Federation of American Scientists, "Harnessing the Power of Video Games for Learning", *Summit on Educational Games 2006*.
- [3] M. Prensky, *From Digital Game-Based Learning, Chapter 5: Fun, Play and Games: What Makes Games Engaging*, McGraw-Hill, New York, 2001.
- [4] D. Cistic, E. Tijan, A. Kurek, "Mobile Game Based Learning - Taxonomy and Student Experience", *Information Technology Interfaces, 2007, 29th International Conference*, 25-28 June 2007, pp. 299-305
- [5] C. Fabricatore, "Learning and Videogames: An Unexploited Synergy", *AECT 2000*.
- [6] C. Cogoi, D. Sangiorgi and K. Shahin, *mGBL - Mobile Game-Based Learning: Perspectives And Usage In Learning And Career Guidance Topics*, 2006.
- [7] N.A.M. Zin, H.B. Zaman, H.M. Judi, N.A. Mukti, H.M. Amin, S. Sahran, K. Almad, M. Ayob, S. Abdullah, Z. Abdullah, *Gender Differences In Computer Literacy Level Among Undergraduate Students In Universiti Kebangsaan Malaysia(UKM)*, 2000.
- [8] H. Guo, "Visual Material & Learning Aids in Teaching Object Oriented Programming", *7th IEEE-ICS*, Dublin, 2000.
- [9] A. Holzinger, H. Maurer, "Incidental Learning, Motivation And The Tamagotchi Effect: VR-Friends, Chances For New Ways Of Learning With Computers", *Computer Assisted Learning*, Location, 1999, pg. 70.
- [10] <http://webfsktm2.fsktm.um.edu.my/Programme/progSE2.asp>
- [11] <http://www.cam.ac.uk/admissions/undergraduate/courses/compsci>
- [12] <http://www.monash.edu.au/pubs/handbooks/units/FIT1002.html>
- [13] <http://www.stanford.edu/class/cs106b/handouts/01-Course-information.pdf>

